What is claimed is:

1   1.   A method of tuning a decision network comprising:

2   identifying a deviation between a correct interpretation of a data item and an

3   incorrect interpretation of said data item;

4   in a decision network comprising a hierarchical set of nodes and leaves,

5   determining a path of traversed nodes in said decision network resulting in said

6   deviation, wherein said nodes correspond to queries;

7   calculating a measure of goodness at a node in said path using at least one new

8   query as a replacement for an existing query to determine whether said measure of

9   goodness improves using said at least one new query compared to said old query; and

10   if said measure of goodness improves, selecting said at least one new query and

11   regrowing said decision network from said node down through said leaves using said at

12   least one new query at said node.

1   2.   The method of claim 1, wherein said measure of goodness is a measure of
2   conditional entropy or log likelihood.

1   3.   The method of claim 1, wherein said regrowing step includes smoothing said
2   decision network.

1   4.   The method of claim 1, further comprising:
2   testing said regrown decision network using said data item.

1   5.   The method of claim 1, wherein said measure of goodness is calculated at a
2   node that is common to a path resulting in said correct interpretation and common to a
3   path resulting in said incorrect interpretation.

1   6.   The method of claim 1, wherein said decision network is a decision tree model.

1 7. The method of claim 1, further comprising:

2 presenting at least a portion of said decision network in a graphical user interface

3 wherein at least one node from at least one of said paths is distinguished from other

4 nodes of said decision network.

1 8. The method of claim 7, said presenting step further comprising:

2 distinguishing at least one node of said first path from at least one node of said

3 second path.

1 9. The method of claim 7, said presenting step further comprising:

2 distinguishing a node common to said first path and said second path.

10. The method of claim 7, said presenting step further comprising:

presenting decision network information selected from the group consisting of

query information and training data information.

11. The method of claim 1, wherein if at least two new queries result in an improved

measure of goodness, determining a measure of separation in said decision network

3 using each of said queries resulting in said improved measure of goodness.

1 12. A method of tuning a decision network comprising:

2 in a decision network comprising a hierarchical set of nodes and leaves,

3 identifying a path of nodes traversed through said decision network resulting in an

4 interpretation of a data item, wherein said nodes correspond to existing queries;

5 calculating a measure of goodness at a node in said path using a new query as a

6 replacement for one of said existing queries; and

7   if said new query results in an improved measure of goodness compared to said

8   existing query, retraining said decision network using said new query at said node

9   beginning with said node through said leaves of said decision network.

1   13.   The method of claim 12, wherein said decision network is a decision tree model.

1   14.   A graphical user interface configured to display one or more nodes of at least

2   one path in a decision network resulting in a correct interpretation of a data item.

1   15.   The graphical user interface of claim 14, further configured to display one or

2   more nodes of at least one path in said decision network resulting in an incorrect

3   interpretation of said data item.

16.   The graphical user interface of claim 14, wherein said decision network is a

decision tree model.

17.   A machine-readable storage, having stored thereon a computer program having

a plurality of code sections executable by a machine for causing the machine to

perform the steps of:

4   identifying a deviation between a correct interpretation of a data item and an

5   incorrect interpretation of said data item;

6   in a decision network comprising a hierarchical set of nodes and leaves,

7   determining a path of traversed nodes in said decision network resulting in said

8   deviation, wherein said nodes correspond to queries;

9   calculating a measure of goodness at a node in said path using at least one new

10   query as a replacement for an existing query to determine whether said measure of

11   goodness improves using said at least one new query compared to said old query; and

12   if said measure of goodness improves, selecting said at least one new query and

13   regrowing said decision network from said node down through said leaves using said at

14   least one new query at said node.

1   18.   The machine-readable storage of claim 17, wherein said measure of goodness is

2   a measure of conditional entropy or log likelihood.

1   19.   The machine-readable storage of claim 17, wherein said regrowing step includes

2   smoothing said decision network.

20.   The machine-readable storage of claim 17, further comprising:
       testing said regrown decision network using said data item.

21.   The machine-readable storage of claim 17, wherein said measure of goodness is
calculated at a node that is common to a path resulting in said correct interpretation and
common to a path resulting in said incorrect interpretation.

22.   The machine-readable storage of claim 17, wherein said decision network is a
decision tree model.

1   23.   The machine-readable storage of claim 17, further comprising:

2   presenting at least a portion of said decision network in a graphical user interface

3   wherein at least one node from at least one of said paths is distinguished from other

4   nodes of said decision network.

1   24.   The machine-readable storage of claim 23, said presenting step further

2   comprising:

3   distinguishing at least one node of said first path from at least one node of said

4   second path.

P1009724;5   20

1   25.   The machine-readable storage of claim 23, said presenting step further

2   comprising:

3   distinguishing a node common to said first path and said second path.

1   26.   The machine-readable storage of claim 23, said presenting step further

2   comprising:

3   presenting decision network information selected from the group consisting of

4   query information and training data information.

27.   The machine-readable storage of claim 17, wherein if at least two new queries result in an improved measure of goodness, determining a measure of separation in said decision network using each of said queries resulting in said improved measure of goodness.

28.   A machine-readable storage, having stored thereon a computer program having a plurality of code sections executable by a machine for causing the machine to perform the steps of:

    in a decision network comprising a hierarchical set of nodes and leaves, identifying a path of nodes traversed through said decision network resulting in an

6   interpretation of a data item, wherein said nodes correspond to existing queries;

7   calculating a measure of goodness at a node in said path using a new query as a

8   replacement for one of said existing queries; and

9   if said new query results in an improved measure of goodness compared to said

10   existing query, retraining said decision network using said new query at said node

11   beginning with said node through said leaves of said decision network.

1   29.   The machine-readable storage of claim 28, wherein said decision network is a

2   decision tree model.